

IN THE CLAIMS:

- 1 1. (CURRENTLY AMENDED) A switch for a computer network, the switch to receive-
2 ~~ereceiving~~ ATM cells from the computer network, comprising:
3 a switching fabric configured to receive ~~receiving~~ a cell at an input port, said
4 switching fabric selecting a route there-through for said cell to an output port;
5 at least one queue within said switching fabric, said queue having an associated
6 threshold, said switching fabric configured to determined~~determining~~ the number of cells
7 present in said queue, said switching fabric further configured to determined~~determining~~ if
8 the next arriving cell for said at least one queue fills said queue above said threshold, and
9 in the event that said at least one queue is filled above said threshold, then write ~~writing~~ a
10 flag bit within said cell to a "set" state; and
11 a traffic manager configured to compute a ratio of cells having said flag bit set to
12 a total number of cells received at an output port, and in response to a value of said ratio
13 either discard~~disarding~~ said cell or forward~~forwarding~~ said cell onto an output link of
14 said computer network, said traffic manager configured to select ~~disarding step selecting~~
15 a cell to be discarded on a random basis.
- 1 2. (ORIGINAL) The switch of claim 1 further comprising:
2 an ASIC chip having said traffic manager implemented therein.
- 1 3. (ORIGINAL) The switch of claim 1 wherein said flag bit further comprises:
2 an EFCI bit of said ATM cell.
- 1 4. (ORIGINAL) The switch of claim 1 further comprising:
2 a switch fabric card, said switch fabric card having switching fabric chips and said
3 traffic manager mounted thereon.

- 1 5. (CURRENTLY AMENDED) The switch of claim 1 further comprising:
2 an IP linecard, said IP linecard configured to receive~~receiving~~ TCP/IP computer
3 packets from a computer network and forward~~forwarding~~ ATM cells to said switching
4 fabric.
- 1 6. (CURRENTLY AMENDED) The switch of claim 1 further comprising:
2 an IP linecard, said IP linecard configured to receive~~receiving~~ ATM cells from
3 said switching fabric and forward~~forwarding~~ TCP/IP computer packets onto a computer
4 network.
- 1 7. (CURRENTLY AMENDED) A switch for a computer network, the switch to receive
2 ~~receiving~~ IP packets from the computer network, comprising:
3 a line card to convert said IP packets to fixed length segments;
4 a switching fabric configured to receive~~receiving~~ said fixed length segments from
5 said line card at an input port, said switching fabric configured to select~~selecting~~ a route
6 there-through for said fixed length segment to an output port;
7 at least one queue within said switching fabric, said queue having an associated
8 threshold, said switching fabric configured to determine~~determining~~ the number of fixed
9 length segments present in said queue, said switching fabric configured to determine~~determining~~
10 ~~termining~~ if the next arriving fixed length segment for said at least one queue fills said
11 queue above said threshold, and in the event that said at least one queue is filled above
12 said threshold, then write~~writing~~ a flag bit within said fixed length segment to a "set"
13 state;
14 a traffic manager configured to compute a ratio of fixed length segments having
15 said flag bit set to a total number of fixed length segments received at an output port, and
16 in response to a value of said ratio either discard~~discarding~~ said fixed length segment or
17 forward~~forwarding~~ said fixed length segment onto an output link of said computer net-
18 work, said traffic manager configured to select~~discarding step selecting~~ a fixed length
19 segment to be discarded on a random basis.

1 8. (PREVIOUSLY PRESENTED) The switch as in claim 7 further comprising:
2 said fixed length segment is an ATM cell and said flag bit is an EFCI bit of said
3 ATM cell.

1 9. (CURRENTLY AMENDED) A switch for a computer network, the switch to receive
2 ~~receiving~~ data cells from the computer network, comprising:

3 a switching fabric configured to receive~~receiving~~ a cell at an input port, said
4 switching fabric configured to select~~selecting~~ a route there-through for said cell to an
5 output port;

6 at least one queue within said switching fabric, said queue having an associated
7 threshold, said switching fabric configured to determine~~determining~~ the number of cells
8 present in said queue, said switching fabric configured to determine~~determining~~ if the
9 next arriving cell for said at least one queue fills said queue above said threshold, and in
10 the event that said at least one queue is filled above said threshold, then write~~writing~~ a
11 flag bit within said cell to a "set" state;

12 means for computing a ratio of cells having said flag bit set to a total number of
13 cells received at an output port, and in response to a value of said ratio either discarding
14 said cell or forwarding said cell onto an output link of said computer network, said means
15 configured to select~~discarding step selecting~~ a cell to be discarded on a random basis.

1 10. (PREVIOUSLY PRESENTED) The apparatus as in claim 9 wherein said data cells
2 further comprise ATM cells.

1 11. (PREVIOUSLY PRESENTED) The apparatus as in claim 9 wherein said data cells
2 further comprise fixed length data cells.

1 12. (PREVIOUSLY PRESENTED) The apparatus as in claim 9 wherein said data cells
2 further comprise IP cells.

1 13. (ORIGINAL) A method of operating a network switch, said network switch receiv-
2 ing fixed length segments from a computer network, comprising:

3 receiving a fixed length segment at an input port of a switching fabric, said
4 switching fabric selecting a route through said switching fabric from an input port to an
5 output port of said switching fabric for said fixed length segment;

6 maintaining at least one queue of fixed length segments within said switching fab-
7 ric, said queue having an associated threshold,

8 determining the number of fixed length segments present in said queue, and de-
9 termining if the next arriving fixed length segment for said at least one queue fills said
10 queue above said threshold, and in the event that said at least one queue is filled above
11 said threshold, then writing a flag bit within said fixed length segment to a "set" state;

12 computing a ratio of fixed length segments having said flag bit set to a total num-
13 ber of fixed length segments received at an output port, and in response to a value of said
14 ratio either discarding said fixed length segment or forwarding said fixed length segment
15 onto an output link of said computer network, said discarding step selecting a fixed
16 length segment to be discarded on a random basis.

1 14. (ORIGINAL) The method of claim 13 further comprising:

2 using as said fixed length segment an ATM cell, and using as said flag bit an
3 EFCI bit of said ATM cell.

1 15. (ORIGINAL) The method of claim 13 further comprising:

2 using a Random Early Detection (RED) computational method to select said fixed
3 length segment to be discarded on a random basis.

1 16. (ORIGINAL) A method of operating a network switch, said network switch receiv-
2 ing TCP/IP computer packets from a computer network, comprising:

3 converting said TCP/IP packets to fixed length packets, said switching fabric se-
4 lecting a route through said switching fabric from an input port to an output port of said
5 switching fabric for said fixed length segment;

6 maintaining at least one queue of fixed length segments within said switching fab-
7 ric, said queue having an associated threshold,

8 determining the number of fixed length segments present in said queue, and de-
9 termining if the next arriving fixed length segment for said at least one queue fills said
10 queue above said threshold, and in the event that said at least one queue is filled above
11 said threshold, then writing a flag bit within said fixed length segment to a "set" state;

12 computing a ratio of fixed length segments having said flag bit set to a total num-
13 ber of fixed length segments received at an output port, and in response to a value of said
14 ratio either discarding said fixed length segment or forwarding said fixed length segment
15 onto an output link of said computer network, said discarding step selecting a fixed
16 length segment to be discarded on a random basis.

1 17. (ORIGINAL) The method of claim 16 further comprising:

2 using as said fixed length segment an ATM cell, and using as said flag bit an
3 EFCI bit of said ATM cell.

1 18. (ORIGINAL) The method of claim 16 further comprising:

2 using a Random Early Detection (RED) computational method to select said fixed
3 length segment to be discarded on a random basis.

1 19. (CURRENTLY AMENDED) A computer readable media containing instructions for
2 ~~practice of the method of operating a network switch~~, said network switch receiving fixed
3 length segments from a computer network, the instructions comprising instructions con-
4 figured to:

5 ~~receive~~receiving a fixed length segment at an input port of a switching fabric, and
6 ~~to select~~said switching fabric selecting a route through said switching fabric from an in-
7 put port to an output port of said switching fabric for said fixed length segment;
8 ~~maintain~~maintaining at least one queue of fixed length segments within said
9 switching fabric, said queue having an associated threshold,
10 ~~determine~~determining the number of fixed length segments present in said queue,
11 and ~~determine~~determining if the next arriving fixed length segment for said at least one
12 queue fills said queue above said threshold, and in the event that said at least one queue is
13 filled above said threshold, then ~~write~~writing a flag bit within said fixed length segment
14 to a "set" state;
15 ~~compute~~computing a ratio of fixed length segments having said flag bit set to a to-
16 tal number of fixed length segments received at an output port, and in response to a value
17 of said ratio either ~~discard~~discarding said fixed length segment or ~~forward~~forwarding said
18 fixed length segment onto an output link of said computer network, said instructions con-
19 figured to select~~discarding step selecting~~ a fixed length segment to be discarded on a ran-
20 dom basis.

1 20. (CURRENTLY AMENDED) Electromagnetic signals propagating on a computer
2 network, said electromagnetic signals carrying information for ~~the practice of the method~~
3 ~~of operating~~ a network switch, said network switch receiving fixed length segments from
4 a computer network, the information comprising instruction configured to:
5 ~~receive~~receiving a fixed length segment at an input port of a switching fabric, and
6 ~~to select~~said switching fabric selecting a route through said switching fabric from an in-
7 put port to an output port of said switching fabric for said fixed length segment;
8 ~~maintain~~maintaining at least one queue of fixed length segments within said
9 switching fabric, said queue having an associated threshold,
10 ~~determine~~determining the number of fixed length segments present in said queue,
11 and ~~determine~~determining if the next arriving fixed length segment for said at least one
12 queue fills said queue above said threshold, and in the event that said at least one queue is

13 filled above said threshold, then ~~write~~writing a flag bit within said fixed length segment
14 to a "set" state;

15 ~~compute~~computing a ratio of fixed length segments having said flag bit set to a to-
16 tal number of fixed length segments received at an output port, and in response to a value
17 of said ratio either ~~discard~~discarding said fixed length segment or ~~forward~~forwarding
18 said fixed length segment onto an output link of said computer network, said instructions
19 configured to select~~discarding step selecting~~ a fixed length segment to be discarded on a
20 random basis.

1 21. (NEW) An ATM switch for receiving ATM cells from a computer network, the
2 ATM switch comprising:

3 a switching fabric configured to receive a cell at an input port, the switching fab-
4 ric selecting a route for the cell to an output port;

5 a queue within the switching fabric, the queue having an associated threshold, the
6 switching fabric configured to determine the number of cells present in the queue, the
7 switching fabric further configured to determine that the queue is filled above a threshold
8 and in response set congestion indicator fields within a newly arrived cells at the switch-
9 ing fabric;

10 a traffic manager, external to the switching fabric, the traffic manager configured
11 to monitor cells received at the output port and configured to discard cells, in response to
12 a ratio of cells having the congestion indicator field set to a total number of cells; and

13 wherein the number of cells present in the queue is inaccessible to the traffic
14 manager.

1 22. (NEW) The switch of claim 21 further comprising:

2 an ASIC chip having said traffic manager implemented therein.